

PATENT SPECIFICATION

(11) 1283393

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DRAWINGS ATTACHED

- (21) Application No. 43176/69 (22) Filed 29 Aug. 1969
- (31) Convention Application No. P 17 79 616.6
- (32) Filed 3 Sept. 1968
- (31) Convention Application No. P 19 43 189.1
- (32) Filed 25 Aug. 1969 in
- (33) Germany (DT)
- (45) Complete Specification published 26 July 1972
- (51) International Classification B26D 1/04
- (52) Index at acceptance

B4B 51B 51X 54D2



(54) CUTTING APPARATUS AND CUTTING HEAD THEREFOR

(71) We, ZÄNGL GMBH, a German company of Munchen 13, Frohschammerstrasse 14, West Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a cutting apparatus. The apparatus is particularly but not exclusively suitable for cutting rubber or similar materials, e.g. floor coverings of plastics material, rubber or linoleum.

According to this invention, there is provided a cutting apparatus comprising a cutting head which includes a pair of contact members which are electrically insulated from each other, a housing which carries the cutting head and in which is disposed a transformer having primary and secondary windings and constituting an electric heating means, the secondary windings being connected across the contact members and a cutting blade adapted to be mounted between the contact members in such a manner that, in operation, the blade short-circuits the secondary windings and is heated up on energisation of the primary windings.

The invention is illustrated, merely by way of example, in the accompanying drawings, in which:

Figure 1 is a diagrammatical side elevation of a cutting apparatus according to the invention;

Figure 2 is a plan view of the apparatus of Figure 1;

Figure 3 is a front elevation of the apparatus of Figure 1;

Figure 4 is a view from above of a cutter head of the apparatus of Figure 1;

Figure 5 is a side elevation of an embodiment of a cutter blade for a cutting apparatus according to the present invention; and

Figure 6 is a further embodiment of a cutter

blade for a cutting apparatus according to the present invention. 45

Figures 1 to 3 show an embodiment of a cutting apparatus 100 according to the invention. The front end of the cutting apparatus 100, adapted to be moved in the direction of the arrow A (Figure 2), carries a cutter head 320, shown in more detail in Figure 4. The cutter head 320 consists of two contact members 321, 322, which are electrically insulated from each other and between which is mounted a cutter blade 323. The cutter head 320 is screwed to the underside of the housing of the cutting apparatus 100. The secondary windings of a transformer arranged within the housing are connected across the contact members, and the primary windings of the transformer may be connected by a switch 101 and a lead, not shown, to the mains when the cutter blade short-circuits the secondary windings and is heated up. The switch 101 is operated automatically, when a lever 102, mounted pivotably on the housing, is operated. The lever 102 is cranked in the direction of movement A so that during the movement a pressure is exerted on the cutter blade 323 and the same is pressed into the material to be cut. On the side remote from the cutter head 320, two guide rollers 103, 104 are mounted on the housing. Co-axially with the two rollers 103, 104, a further roller 106 is mounted for rotation on a rod 105 which has a length substantially equal to one half of the width of the housing. This roller 106 is located substantially in the extension of one side edge of the housing of the cutting apparatus (see Figure 2). The rollers 103, 104, 106 enable, in conjunction with the cutter head 320, sliding of the cutting apparatus along the material to be cut, and satisfactory guiding thereof. 50

One contact member 321 projects further downwardly (as viewed) than the other contact member 322. Furthermore, in order to pro- 55

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duce a satisfactory rectilinear cut, a slide rail 107 is provided, having a vertically upwardly bent web 108 (Fig. 1). The side rail 107 is placed on the material to be cut and 5 the blade 323 is guided in exactly parallel relationship by the guide rollers 103, 104 and 106 and the inner surface of the contact member 321, resting on the web 108 (Fig. 3).

Fig. 4 shows the cutter head 320 in plan 10 view. This head consists of the two contact members 321, 322 which are screwed to the housing, and the front ends of which carry the cutter blade 323. The cutter blade 323 is flat and has two legs 324, 325, extending 15 along the plane of the blade. The plane of the blade—see also Fig. 1—extends in the direction of cutting.

The front end of the contact member 321 carries one leg of the cutter blade 323 in a 20 readily removable and replaceable manner. To this end, the front inner edge is provided with a recess 326 in which the blade 323 is located so that it protrudes somewhat beyond the inner edge 327 of the contact member 25 321, and a clamping plate 328 rests thereon. The clamping plate 328 embraces with its front face 329 the front edge of the contact member 321 and rests with its rear edge 330 on a sloping surface 331 formed in the contact 30 member 321. The centre of the clamping plate 328 has a tapped aperture formed therein; a screw 332 extends through this opening and engages in said aperture.

The front end of the contact member 322 35 extends so far beyond the front edge of the contact member 321 that one blade leg 325 is arranged in front of the other blade leg, as viewed in the direction of cutting. To this end, the front edge of the contact member 40 322 has a recess 333. The leg 325 of the blade is also located by means of a clamping plate 334, pressed by means of a screw 335 against the tapered front side of the contact member 322. The leg 337 of the contact member 45 334 is arranged to slide on an oblique guide surface 336 so that the leg 338 of the contact member is firmly pressed against the blade leg 325.

Figs. 5 and 6 show two preferred embodiments of the blade, 323a and 323b respectively. The blade shown in Fig. 5 may be used for cutting both in the forward and reverse directions. The cutter blades 323a and 323b are preferably made of steel.

According to a further preferred embodiment, a straight (linear) slot (not shown) may be made in the underside of one of the contact members 321 which may slidably receive and co-operate with the web 108 to 60 guide the cutting head accurately.

WHAT WE CLAIM IS:—

1. A cutting apparatus comprising a cutting head which includes a pair of contact mem-

bers which are electrically insulated from each other, a housing which carries the cutting head and in which is disposed a transformer having primary and secondary windings and constituting an electric heating means, the secondary windings being connected across the contact members and a cutting blade adapted to be mounted between the contact members in such a manner that, in operation, the blade short-circuiting the secondary windings and is heated up on energisation of the primary windings.

2. Apparatus as claimed in claim 1 wherein the blade is substantially U-shaped and flat in the plane of cutting.

3. Apparatus as claimed in claim 1 wherein the blade is substantially V-shaped and flat in the plane of cutting.

4. Apparatus as claimed in claim 1 wherein the blade has two legs and an interconnecting portion which makes an acute angle with the plane of cutting.

5. Apparatus as claimed in any preceding claim wherein a pair of clamping plates are provided for clamping the blade against the contact members, the contact members defining an internal recess, one of said clamping plates being located in said recess and adjustably secured to one of said contact members, while the other clamping plate is rigidly secured to the other contact member on the side thereof remote from said internal recess.

6. Apparatus as claimed in claim 5 wherein said side of the other contact member is formed with an oblique guide surface which is engaged by an end portion of the other clamping plate the other end portion of which clamps the blade.

7. Apparatus as claimed in any preceding claim wherein the cutting head is disposed at one end of the said housing the other end of which carries a pivotally mounted and cranked actuating lever, pivotal movement of said lever causing said blade to move relative to the cutting plane.

8. Apparatus as claimed in claim 7 wherein an electric switch is so disposed at said other end of the housing that pivotal movement of said lever in one angular sense causes said switch to be operated to switch on the heating for the blade.

9. Apparatus as claimed in any preceding claim wherein rotatable guide rollers are mounted on said housing.

10. Apparatus as claimed in claim 9 wherein said rollers include three coaxial rollers mounted at the rear of the housing relative to the direction of cutting, one of said rollers being mounted on a shaft extending laterally from the housing.

11. Apparatus as claimed in claim 10 wherein the other two of said rollers are adjacent the said longitudinal axis, while said one roller is disposed at the end of said shaft

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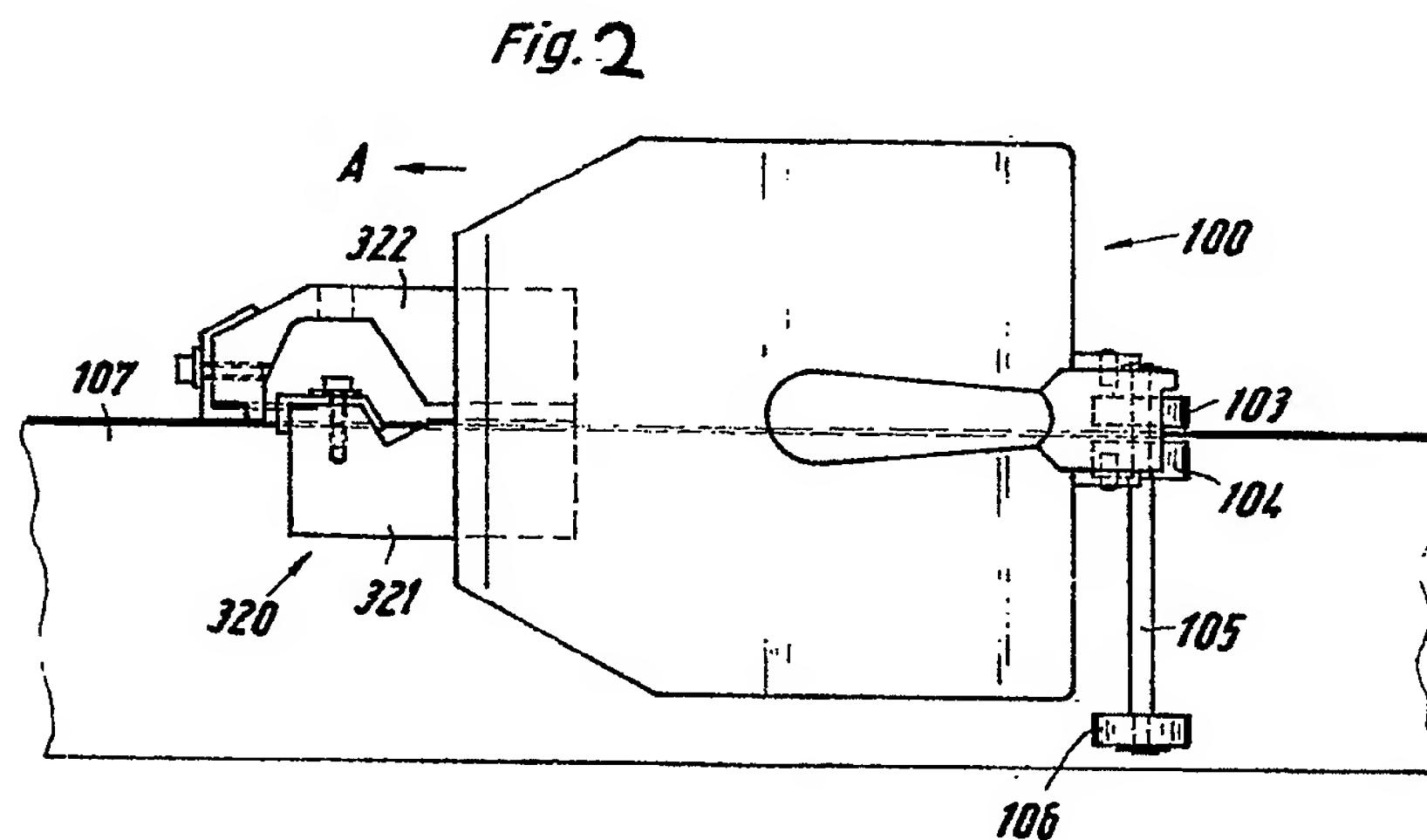
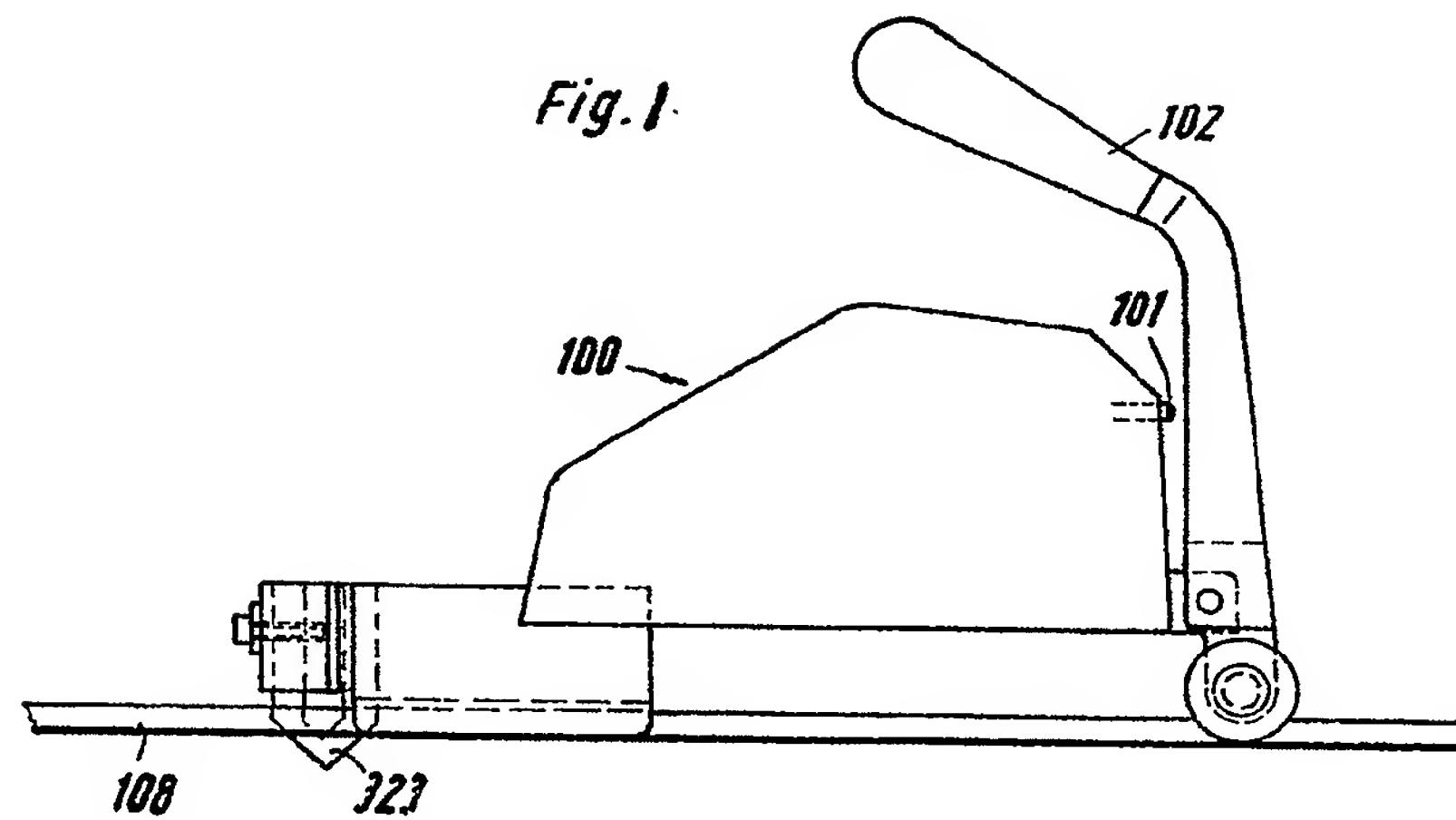
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- which has a length substantially equal to half the width of the housing.
12. Apparatus as claimed in any of claims 9 to 11 wherein a slide rail having an upstanding guiding web is provided for guiding the apparatus, one of said rollers and the inner edge of one of said contact members being in engagement with said upstanding guiding web.
13. Apparatus as claimed in claim 12 wherein only the underside of the said one contact member engages in operation the slide rail.
14. Apparatus as claimed in claim 12 or 13
- wherein the underside of the said one contact member is provided with a slot for sliding engagement with the web, whereby to guide the cutting head accurately.
15. Cutting apparatus substantially as hereinbefore described and as shown in the accompanying drawings.

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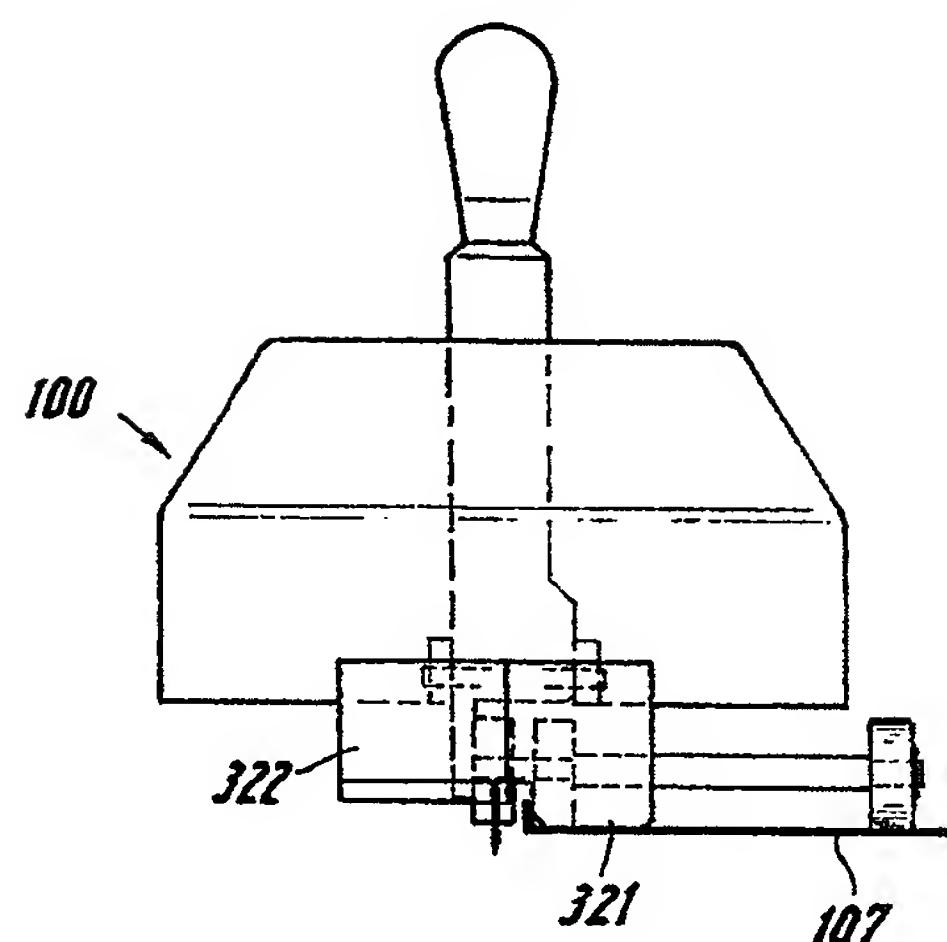
Printed for Her Majesty's Stationery Office, by the Courier Press, Leamington Spa, 1972.
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from
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Fig. 3



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Fig. 4

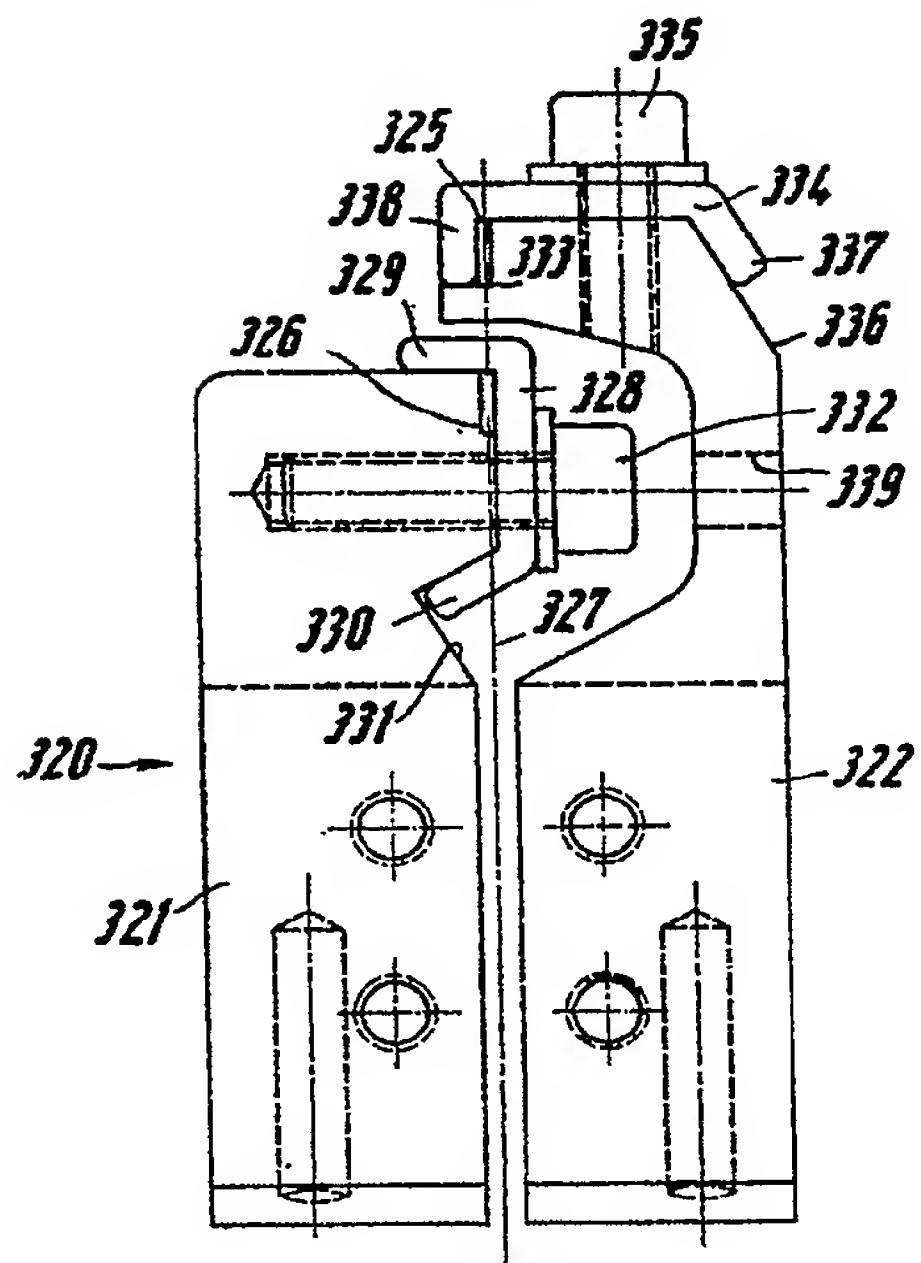


Fig. 5

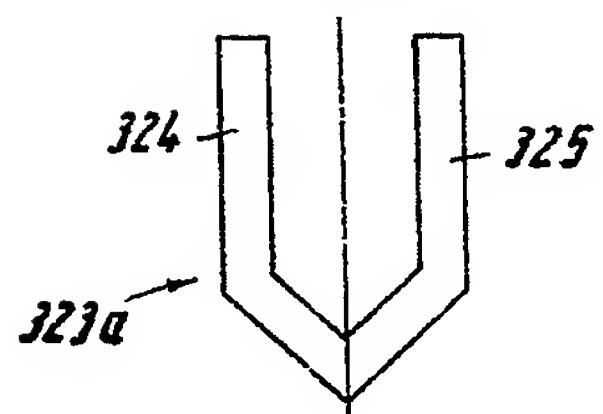


Fig. 6

